DOCUMENT RESUME

ED 221 946 EA 015 056

TITLE	The Administrative Use of Microcomputers. Technical Report.
INSTITUTION	Alabama Univ., University. Coll. of Education.
PUB DATE	Aug 82
NOTE	15p.; Computer graphics may reproduce poorly. Prepared by the Alabama Center for Evaluation.
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Oriented Programs; Educational Administration; Elementary Secondary Education; Equipment Evaluation; Equipment Utilization; *Evaluation Criteria; *Microcomputers; Planning; *Purchasing; School Administration; Staff Development
IDENTIFIERS	Atlanta South Metro Psychoeducational Center GA

ABSTRACT

Citing the growing interest in using microcomputers as an aid in educational administration, this report discusses factors that must be considered when purchasing a computer and describes an actual case of computer implementation for administrative purposes. The first steps in the purchasing process are to assess and to prioritize the administrative uses for the computer, to ensure purchase of an effective system, and to regulate its implementation. Costs to be considered when selecting a system include not only those for hardware and software, but also those for training the staff, obtaining incidental equipment, maintaining service contracts, and providing suitable operating space. The potential utility of the system must be weighed against any obstacles to easy implementation of the system, including possible staff resistance. Software selection should involve evaluation of alternative programs and of the expert support available. Inservice training programs aimed at developing specific staff skills should be planned carefully. Finally, an evaluation plan incorporating needs assessment, formative evaluation, and product evaluation should be included in the purchasing process. The Atlanta (Georgia) South Metro Psychoeducational Center considered the above factors in designing a successful six-phase development and installation plan for its data management system. (PGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED221946

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

James E. McLean

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ALABAMA CENTER FOR EVALUATION

EA 015 056

COLLEGE OF EDUCATION

THE UNIVERSITY OF ALABAMA

THE ADMINISTRATIVE USE OF MICROCOMPUTERS

TECHNICAL REPORT

AUGUST, 1982

Alabama Center for Evaluation
College of Education
University of Alabama
University, Alabama 35486
(205) 348-7575

James E. McLean, Director
Todd M. Davis, Associate Director
George E. McCormick, Evaluation Associate

The staff of ACE wishes to express its appreciation to Dr. Robert Beach for initiating some of the ideas contained in this report.

Introduction

Since the orbiting of the Russian Sputnik in 1957, educators have had a series of mixed experiences with educational technology. Typically, new technologies have carried a high price in both unfulfilled expectations and dollar costs. Administrators over the last two and a half decades have witnessed the introduction into the schools of technologies as diverse as our goals. These have included educational television, programmed instruction, and now the microprocessor.

The early 1960's saw a flood of television purchasing and educational programming. Within several years many of these sets and most of the programs were gathering dust in real and metaphorical closets around the country. During the middle and late 1960's programmed instruction and "teaching" machines inspired by B. F. Skinner were seized upon as potential extenders for understaffed schools struggling to cope with the press of high enrollments. Where are the teaching machines in the 1980's? Today the latest suitor for the hearts and dollars of educators is the microprocessor. In the last three years this new technology, in the form of the microcomputer, has been sold to educators as the new panacea for instructional and administrative problems.

While new technologies have changed the face of instruction only slightly, they have had a significant and enduring impact on the administration of educational systems. Today there are few large or midsized school systems which could function without significant main-frame computer support. Typically, this support on the district level involves the management of payroll, personnel files, student test scores, attendance records, and basic student demographic information. Perhaps the most enduring and effective use of microcomputers may emerge in the administrative sector, particularly on the building level. Currently, micros are being used in the private sector by small and mid-sized businesses for word processing, data management, and accounting tasks.

Today's administrator is facing a crushing burden in terms of managing student and administrative information. The demands for reports to local, state, and federal agencies necessitate the maintenance of vast stores of information on each Student. The processing of this information using pencil and paper techniques requires the expenditure of significant administrative time and attention. It has been estimated that reporting requirements add an estimated 8% to each school's operating budget in direct costs (Kenny & Rentz, 1970). In Alabama, principals may submit over 50 separate reports to their central offices, which are compiled and transmitted to the State Department of Education, accreditation agencies, and the Federal Government. These may include at the very least attendance, food service, textbook inventory, library, milk program, guidance, and compensatory education.

In addition to reporting requirements, the operation of the school's instructional program requires the manipulation of significant amounts of information. The scheduling of classes and the maintenance of class rosters entails weeks of work at the beginning of each semester. Effective programs of student discipline and school parent contact frequently require the preparation of individualized letters. The maintenance of special education programs requires the development of IEP records and frequent reports to parents.

Because of the reporting requirements and the subsequent information management requirements, interest in microcomputing on the building level is emerging. Educational administrators and their staff are discovering that while a computer is indeed an incredible "number cruncher" this function is overshadowed by the machine's capacity to manipulate words and other nonnumeric information.

Typically, an individual administrator with a preexisting interest in computing acquires a machine and by trial and error begins to write programs and utilize commercially available software. Software is a set of instructions which allows a user to communicate with a computer. In an informal fashion, small fragmented networks of computer-using administrators have begun to learn what hardware (the actual machine and its related equipment) and software configurations, utilization patterns, and physical arrangements may be optimally combined for administrative purposes.

Unfortunately, even while some of this basic information is being developed in isolated instances, it is unlikely that the widespread use of microcomputer technology will be realized without substantial well-planned training programs and acceptable accounting procedures for assessing the total costs associated with the automation of administrators' functions. The evaluation of the implementation and use of microprocessors is also an integral part of an effective adoption plan.

The remainder of this report itemizes purchase considerations and provides an example. Purchase considerations include the prioritization of needs, costing the system, personnel resistance, software selection, staff training, and evaluation. The example is the process which was used for the selection, purchase, and implementation of a microcomputer-based management system at the South Metro Psychoeducational Center in Atlanta, Georgia.

Purchase Considerations

The concerns related to the purchase and implementation of a microcomputer-based system are often not associated with the acquisition of the more common pieces of equipment. These considerations are the need to define and prioritize pragmatic need, unusual problems in costing, personnel resistance, software selection, staff training, and evaluation.

Prioritization

Unlike the acquisition of a computer for instructional purposes, the function of the administrative machine must be pretargeted to justify its purchase. While there is no lack of possible work for such a machine, the administrator who attempts to automate a variety of tasks simultaneously will likely produce chaos in the front office. A system that is implemented improperly or hastily will add to the work of the office staff. This process may stretch over a three- to six-month time span. Caution is essential as the risks of failure are potentially large. Process evaluation during this time serves to help minimize potential pitfalls.

Costing Microcomputer Systems

The direct costs of a computer system are relatively straightforward to calculate. Primarily, they entail the price of the hardware and selected software packages. At this time, microcomputer hardware suitable for administrative use may be acquired for approximately $2,000 to $8,000. Similarly configured machines available from the larger microcomputer manufacturers may run close to $6,000. Such a computer will consist of a TV monitor, computer, and keyboard (48K CPU), two disk drives, letter quality printer, and several selected software packages.

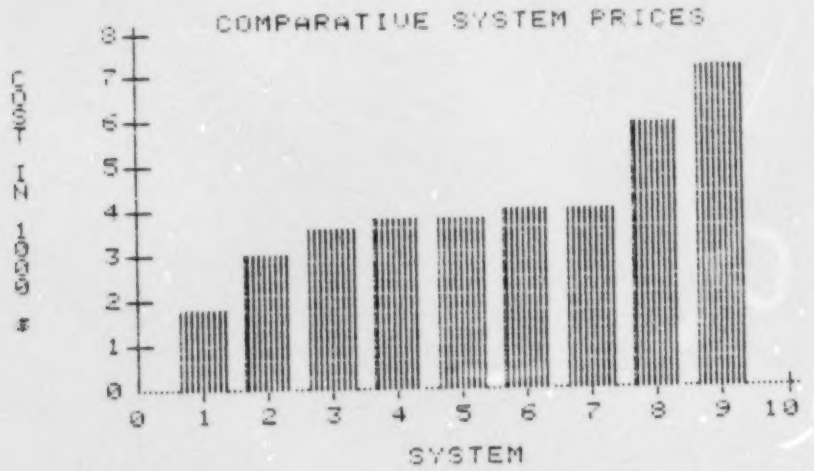


Figure 1. Comparative system costs (approximate).

As Figure 1 suggests, the major manufacturers are quite cost competitive. However, the acquisition of hardware on the basis of price alone is not sufficient to make a purchasing decision. As we will discuss, the crucial decisions also concern anticipated tasks and associated software acquisition. Training time and planning will be significantly affected by the particular software that is purchased.

There are substantial hidden costs in the use of automated systems which are difficult to calculate. Preliminary work suggests that training costs in terms of staff hours may at least equal the direct costs of the system itself. The relationship between the number of

functions automated and the associated time needed to train staff is unknown.

Currently, computer-using educators are a rarity. They enjoy using computers and learning about them. If computers are to become a fixture on the building level, we must acknowledge that the secretarial and clerical level personnel who will operate the systems may not have the same initial level of interest in these machines as do the current crop of computer-using educators. Indeed, they may view the prospect of office automation with suspicion or distrust. If these machines are to be used effectively, the administrator must think through the reward and incentive system for staff. Provision must be made for an ongoing program of staff development if the new acquisition is to be more than a hobbyist's plaything.

Administrators do not normally budget training time at rates commensurate with salary (if we budget training at all). A secretary independently learning to use a system to run simple programs can dedicate up to four weeks in self-instruction. At a cost of $5.00 per hour, at least $1,800 in dollar equivalent services are lost elsewhere. With an organized instructional program such as we suggest later in this paper, the progress of training will proceed more rapidly, yet real dollar costs in consulting fees may be incurred.

Additional "creep" and operating costs are similarly unknown. Creep costs are a perverse form of operating cost that administrators are familiar with in other contexts. In the context of computing, they take the form of unanticipated purchases of paper trays to hold print-outs, extra backup disks, additional firmware, and that "special" commercial program. These items, while individually inexpensive, together will add several hundred dollars to the cost of operating a $5,000 system over a year's time.

While small computers are quite reliable, the prudent user should expect to maintain a service contract either with the manufacturer or a reputable local dealer. Typically, the costs of such contracts will be about $500 for the first year. Other types of operating expenses will be for paper, printer ribbons, and printwheels. While the precise costs are a function of use, they are likely to be in the $250 range for the

first year. A budget line of $750 to $1,000 per system is therefore not an unrealistic estimate for an operating budget.

Additional and unexpected operating costs may be incurred while finding a suitable work space for the computer system. Security of the software and hardware from both theft and unauthorized access to sensitive information stored on disks may necessitate a separate room. Thus, the system will occupy a space which presumably was previously utilized for other purposes. For some users, this may entail additional costs in terms of relocation or space modification.

Personnel Resistance

Perhaps the most formidable barrier to the widespread utilization of micro technology in building level administration is resistance to automation. Two sources of resistance have been identified. They are (1) lack of resident skills in the educational community and (2) personnel resistance.

While personnel familiar with the use of relatively simple office equipment are generally available in school systems, computer skills in educational circles are a rarity. Estimates of computer-literate educators are typically given in the 1% range for all educators. It is estimated that, for an inexperienced user, approximately 40 hours of training are required to master any of the commonly used business-oriented software packages. In addition, the reading level required to access the instructional manuals and other documentation is far above that of the usual office worker. This state of affairs alone will hinder all but the most dedicated of administrators in exploiting the potential of the microcomputer.

In a survey, Vensel (1981) notes that a surprising "gut-level" distrust of computers exists in the educational community, with 50% of the surveyed teachers reporting that computers were "dehumanizing." Similar findings were reported by Ahl (1976).

Clearly, with the variety of unknowns in terms of applications, costing, and acceptance, it is necessary to carefully consider (1) available software, (2) training procedures specifically targeted for an administrative audience, and (3) plans for implementation.

Software Selection

Perhaps the most crucial decision an administrator will make in computerizing office functions is the selection of commercially available software. Software consists of a set of instructions written in a variety of programming languages to allow a human user to communicate with a computer. Most commercially available software is sold in disk form. All disks look about the same. There is no real way to evaluate the quality of software from packaging appearances.

As previously indicated, careful planning will identify those few crucial administrative needs to be automated. Users must carefully define precisely what they want the computer to do. There are many possible sources of information regarding software evaluation. Conferences, magazines, and vendor advertisements will alert an administrator to the wide range of potential ready-to-use programs, which already number in the hundreds and are increasing rapidly with time. Figure 2 graphically represents the number of different types of widely used packages now on the market.

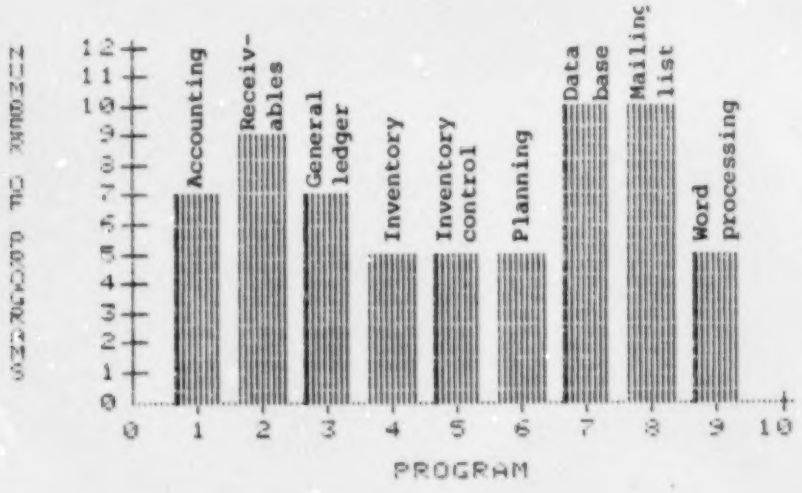


Figure 2. Number of various types of programs now commercially available.

Prior to the purchase of any important software, a potential user will be well-advised to rely on the advice of a knowledgeable colleague who has had experience with the particular package in question or perform an evaluation of the various packages available. While many vendors are knowledgeable, the overall quality of support in most locations is spotty. A vendor who is unwilling or unable to provide a thorough demonstration of a major software system prior to purchase will probably not be able to support you after purchase. Finally, the user must ensure that the hardware is compatible with an intended software purchase. In all cases, users should patronize well-established software houses and reputable dealers, particularly if they themselves are not proficient in programming techniques.

A buyer is well advised to assume that a defect exists someplace in the software or in the interaction of the software and the hardware. In our observation of well over 50 nongame programs, we have not once found a program with no flaws. Find out if your flaw is fatal for your purpose.

Staff Training

Fortunately in recent years the once-haphazard approach to technical inservice training has become more sophisticated. Several models have been developed (Brinkerhoff, 1980; Cooper & Hunt, 1978; Looney, 1978). Their application will be prerequisite to the systematic and effective use of microcomputer technology by the line administrator.

We recommend for those administrators who anticipate computer acquisition that they begin developing inservice training programs for the administrative use of the microcomputer within the following guidelines:

1. Inservice is training, not basic education. It is assumed that staff already possess basic administrative competencies and that what is required will be the mastery of a set of technology specific skills.

2. A competency-based model should be employed. This necessitates the breakdown of larger tasks into smaller, easily assessed bits.

3. The technology to be taught should be utilized in the inservice sessions.

4. Hands on experience is a prerequisite to mastery.

5. Demonstration of acquired skills should be the primary criterion of the effectiveness of the inservice training.

6. Small-group individualized instruction is seen as optimal.

7. Recognition for the participants by the sponsoring organizations is a requirement.

8. Followup maintenance checks should be instituted.

Evaluation

Regardless of the purchase considerations applied in selecting a microcomputer system, its implementation without evaluation considerations may not only lead to failure but no information as to why the implementation failed. Thus, an evaluation plan is an essential part of a decision to consider the automation of some administration functions. An evaluation plan for the purchase of a microcomputing system should include a needs assessment, a process evaluation, and a product evaluation.

The needs assessment involves an analysis of the function to be served by the system and results in the definition of prioritized needs. The results of this assessment can be used to match administrative needs with appropriate hardware and software as well as determine personnel assistance and staff training needs. The needs assessment may also determine that a computer system is not appropriate for the intended application.

The process evaluation serves primarily in a formative capacity. That is, it provides feedback on the implementation in a timely way so that problems can be identified and remedied. In this way, failure can be avoided and the cause of problems can be identified for future reference.

The product evaluation compares the automated system's functioning with that of the prior system. We recommend that both systems be operated simultaneously for a period of time. This simultaneous operation not only facilitates the product evaluation but also eliminates the possibility that an unforeseen flaw in the new system paralyzes the operation.

An Example

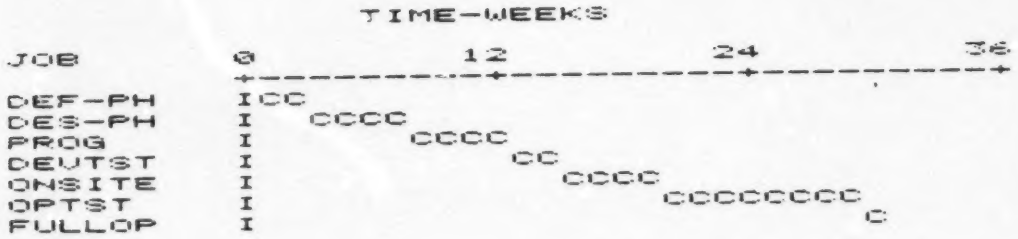
The remainder of this report will detail the process by which an educational agency acquired and utilized a microcomputer-based information management system.

The Atlanta South Metro Psychoeducational Center in Atlanta, Georgia, provides educational and psychological services to handicapped students and their families. Presently, the reporting and record keeping aspects of the center's operation require two clerks and one supervisor a full month to compile the data for transmission to the state.

During the course of an initial onsite needs assessment visit, the data management requirements of the center were examined. At that time, it was determined that a microcomputer-based system could manage the information required by the state. Cost estimates and other needs were also assessed.

A phased implementation cycle was recommended during which time work towards developing and installing a data management system was completed. The cycle consisted of six distinct and interrelated phases.

The definition phase included an initial needs assessment which consisted of general discussions regarding the scope of the problem and the explorations of possible solutions. During the design phase further needs assessment was carried out including definition of the specifics of the center's paper flow. During the programming phase the system was built. During the test phase sample data, provided by the center, were entered into the system, and tests of the system were conducted in order to highlight possible deficiencies in the initial design of the files or the reporting formats. During the training phase the finished system was mounted at the center and demonstrated. Personnel received training in the use of the hardware and the programs designed above. During the implementation phase the system was run in parallel with the existing manual system to complete the product evaluation. This procedure insured that the quality of the data produced by the micro based system was satisfactory and commensurate or superior to the former system. During the operational phase the system became fully operative. At this time center personnel utilized the automated system exclusively.



COMPLETION TIME IN WEEKS = 26

JOB	LENGTH	STARTS EARLY	STARTS LATE
DEF-PH	2	1	1
DES-PH	4	3	3
PROG	4	7	7
DEUTST	2	11	11
ONSITE	4	13	13
OPTST	8	17	17
FULLOP	1	25	25

Figure 3. Developmental phases for a microcomputer-based information system.

Summary

As is illustrated in this report, the decision to purchase and implement a microcomputer-automated system is not to be taken lightly. Evaluation before (needs assessment), during (process evaluation), and

after (product evaluation) implementation will enhance the chances for success. Evaluation must be an integral part of the selection and implementation process.

References

Ahl, D. Survey of public attitudes toward computers in society. The Best of Creative Computing, 1976, 1, 77-79.

Brinkerhoff, R. Evaluation of inservice programs. Teacher Education and Special Education, 1980, 3, 27-38.

Cooper, J., & Hunt, K. A cooperative approach to inservice training. Viewpoints in Teaching and Learning, 1978, 4, 61-69.

Kenney, J., & Rentz, R. Automation and control of public school instructional records. Itasca, Ill.: F. E. Peacock Publishers, 1970.

Looney, P. Inservice for teachers of low incidence handicapped: A competency based training model. Viewpoints in Teaching and Learning, 1978, 4, 119-126.

Vensel, G. Changes in attitudes of preservice special educators towards computers. Teacher Education and Special Education, 1981, 4(3), 40-43.